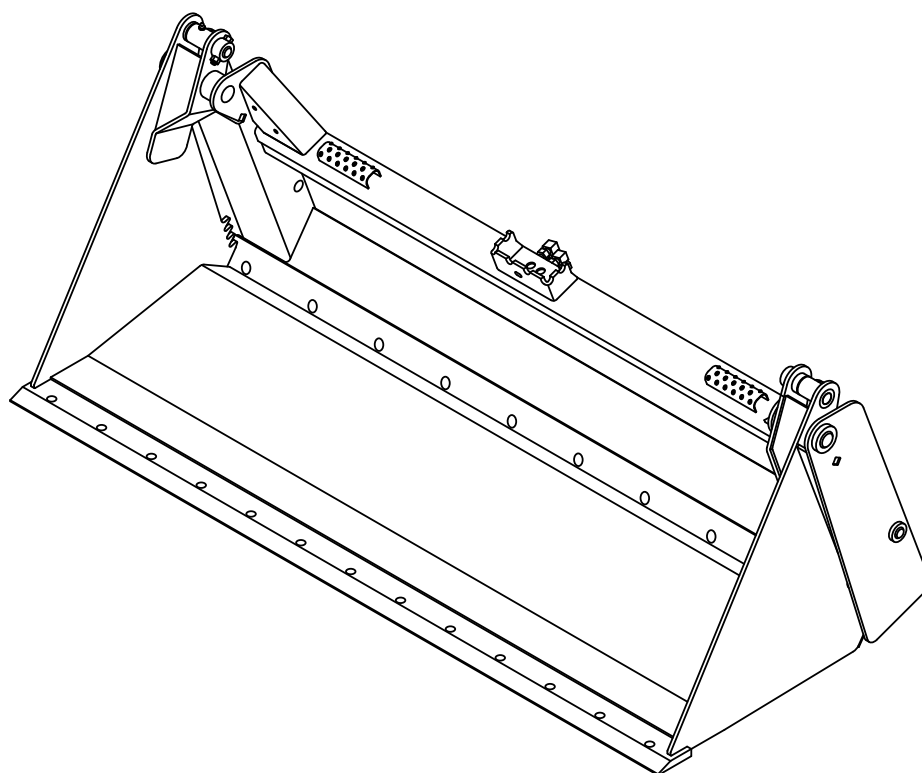




OPERATOR'S AND PARTS MANUAL

4-IN-1 MULTI-PURPOSE BUCKET



FFC SERIAL NUMBER: _____

MACHINE SERIAL NUMBER: _____

Manual Number: MR45544

Models covered:

Constr: LAF0975, LAF0976, LAF0980, LAF0977,
LAF0984, LAF0985, LAF0986, LAF0988,
LAF0989, LAF0990, LAF0991 & LAF0992

HD Constr: LAF3182, LAF3190 & LAF3196

Rev. 3

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PREFACE

GENERAL INFORMATION

This product was carefully designed and manufactured to give you many years of dependable service. Only minor maintenance (such as cleaning and lubricating) is required to keep it in top working condition. Be sure to observe all maintenance procedures and safety precautions in this manual and on any safety decals located on the product and on any equipment on which the attachment is mounted.

WARNING! Never let anyone operate this unit without reading the "Safety Precautions" and "Operating Instructions" sections of this manual.



Always choose hard, level ground to park the vehicle on and set the brake so the unit cannot roll.

Unless noted otherwise, right and left sides are determined from the operator's control position when facing the attachment.

NOTE: The illustrations and data used in this manual were current (according to the information available to us) at the time of printing, however, we reserve the right to redesign and change the attachment as may be necessary without notification.

BEFORE OPERATION

The primary responsibility for safety with this equipment falls to the operator. Make sure the equipment is operated only by trained individuals that have read and understand this manual. If there is any portion of this manual or function you do not understand, contact your local authorized dealer or the manufacturer to obtain further assistance. Keep this manual available for reference. Provide the manual to any new owners and/or operator's

SAFETY ALERT SYMBOL



This is the "Safety Alert Symbol" used by this industry. This symbol is used to warn of possible injury. Be sure to read all warnings carefully. They are included for your safety and for the safety of others working with you.

SERVICE

Use only manufacturer replacement parts. Substitute parts may not meet the required standards.

Record the model and serial number of your unit on the cover of this manual. The parts department needs this information to insure that you receive the correct parts.

SOUND AND VIBRATION

Sound pressure levels and vibration data for this attachment are influenced by many different parameters: some items are listed below (not inclusive):

- prime mover type, age, condition, with or without cab enclosure and configuration
- operator training, behavior, stress level
- job site organization, working material condition, environment

Based on the uncertainty of the prime move, operator, and job site, it is not possible to get precise machine and operator sound pressure levels or vibration levels for this attachment.

NOTE: A list of all Paladin Patents can be found at <http://www.paladinattachments.com/patents.asp>.

SAFETY STATEMENTS



THIS SYMBOL BY ITSELF OR WITH A WARNING WORD THROUGHOUT THIS MANUAL IS USED TO CALL YOUR ATTENTION TO INSTRUCTIONS INVOLVING YOUR PERSONAL SAFETY OR THE SAFETY OF OTHERS. FAILURE TO FOLLOW THESE INSTRUCTIONS CAN RESULT IN INJURY OR DEATH.



DANGER

THIS SIGNAL WORD IS USED WHERE SERIOUS INJURY OR DEATH WILL RESULT IF THE INSTRUCTIONS ARE NOT FOLLOWED PROPERLY.



WARNING

THIS SIGNAL WORD IS USED WHERE SERIOUS INJURY OR DEATH COULD RESULT IF THE INSTRUCTIONS ARE NOT FOLLOWED PROPERLY.



CAUTION

THIS SIGNAL WORD IS USED WHERE MINOR INJURY COULD RESULT IF THE INSTRUCTIONS ARE NOT FOLLOWED PROPERLY.

NOTICE

NOTICE INDICATES A PROPERTY DAMAGE MESSAGE.

GENERAL SAFETY PRECAUTIONS

WARNING!

READ MANUAL PRIOR TO INSTALLATION



Improper installation, operation, or maintenance of this equipment could result in serious injury or death. Operators and maintenance personnel should read this manual, as well as all manuals related to this equipment and the prime mover thoroughly before beginning installation, operation, or maintenance. **FOLLOW ALL SAFETY INSTRUCTIONS IN THIS MANUAL AND THE PRIME MOVER'S MANUAL(S).**



READ AND UNDERSTAND ALL SAFETY STATEMENTS

Read all safety decals and safety statements in all manuals prior to operating or working on this equipment. Know and obey all OSHA regulations, local laws, and other professional guidelines for your operation. Know and follow good work practices when assembling, maintaining, repairing, mounting, removing, or operating this equipment.



KNOW YOUR EQUIPMENT

Know your equipment's capabilities, dimensions, and operations before operating. Visually inspect your equipment before you start, and never operate equipment that is not in proper working order with all safety devices intact. Check all hardware to ensure it is tight. Make certain that all locking pins, latches, and connection devices are properly installed and secured. Remove and replace any damaged, fatigued, or excessively worn parts. Make certain all safety decals are in place and are legible. Keep decals clean, and replace them if they become worn or hard to read.

GENERAL SAFETY PRECAUTIONS

WARNING!



PROTECT AGAINST FLYING DEBRIS

Always wear proper safety glasses, goggles, or a face shield when driving pins in or out, or when any operation causes dust, flying debris, or any other hazardous material.

WARNING!



LOWER OR SUPPORT RAISED EQUIPMENT

Do not work under raised booms without supporting them. Do not use support material made of concrete blocks, logs, buckets, barrels, or any other material that could suddenly collapse or shift positions. Make sure support material is solid, not decayed, warped, twisted, or tapered. Lower booms to ground level or on blocks. Lower booms and attachments to the ground before leaving the cab or operator's station.

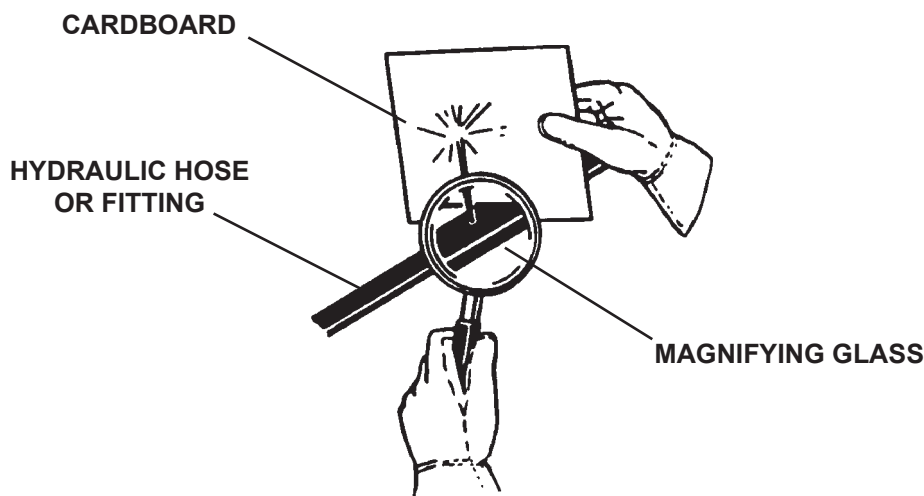
WARNING!



USE CARE WITH HYDRAULIC FLUID PRESSURE

Hydraulic fluid under pressure can penetrate the skin and cause serious injury or death. Hydraulic leaks under pressure may not be visible. Before connecting or disconnecting hydraulic hoses, read your prime mover's operator's manual for detailed instructions on connecting and disconnecting hydraulic hoses or fittings.

- Keep unprotected body parts, such as face, eyes, and arms as far away as possible from a suspected leak. Flesh injected with hydraulic fluid may develop gangrene or other permanent disabilities.
- If injured by injected fluid, see a doctor at once. If your doctor is not familiar with this type of injury, ask him to research it immediately to determine proper treatment.
- Wear safety glasses, protective clothing, and use a piece of cardboard or wood when searching for hydraulic leaks. **DO NOT USE YOUR HANDS!** **SEE ILLUSTRATION.**



GENERAL SAFETY PRECAUTIONS

WARNING!



DO NOT MODIFY MACHINE OR ATTACHMENTS

Modifications may weaken the integrity of the attachment and may impair the function, safety, life, and performance of the attachment. When making repairs, use only the manufacturer's genuine parts, following authorized instructions. Other parts may be substandard in fit and quality. Never modify any ROPS (Roll Over Protection Structure) or FOPS (Falling Object Protective Structure) equipment or device. Any modifications must be authorized in writing by the manufacturer.

WARNING!



SAFELY MAINTAIN AND REPAIR EQUIPMENT

- Do not wear loose clothing or any accessories that can catch in moving parts. If you have long hair, cover or secure it so that it does not become entangled in the equipment.
- Work on a level surface in a well-lit area.
- Use properly grounded electrical outlets and tools.
- Use the correct tools for the job at hand. Make sure they are in good condition for the task required.
- Wear the protective equipment specified by the tool manufacturer.



SAFELY OPERATE EQUIPMENT

Do not operate equipment until you are completely trained by a qualified operator in how to use the controls, know its capabilities, dimensions, and all safety requirements. See your machine's manual for these instructions.

- Keep all step plates, grab bars, pedals, and controls free of dirt, grease, debris, and oil.
- Never allow anyone to be around the equipment when it is operating.
- Do not allow riders on the attachment or the prime mover.
- Do not operate the equipment from anywhere other than the correct operator's position.
- Never leave equipment unattended with the engine running, or with this attachment in a raised position.
- Do not alter or remove any safety feature from the prime mover or this attachment.
- Know your work site safety rules as well as traffic rules and flow. When in doubt on any safety issue, contact your supervisor or safety coordinator for an explanation.

EQUIPMENT SAFETY PRECAUTIONS

WARNING!



KNOW WHERE UTILITIES ARE

Observe overhead electrical and other utility lines. Be sure equipment will clear them. When digging, call your local utilities for location of buried utility lines, gas, water, and sewer, as well as any other hazard you may encounter.

WARNING!



EXPOSURE TO RESPIRABLE CRYSTALLINE SILICA DUST ALONG WITH OTHER HAZARDOUS DUSTS MAY CAUSE SERIOUS OR FATAL RESPIRATORY DISEASE.

It is recommended to use dust suppression, dust collection and if necessary personal protective equipment during the operation of any attachment that may cause high levels of dust.

WARNING!



REMOVE PAINT BEFORE WELDING OR HEATING

Hazardous fumes/dust can be generated when paint is heated by welding, soldering or using a torch. Do all work outside or in a well ventilated area and dispose of paint and solvent properly. Remove paint before welding or heating.

When sanding or grinding paint, avoid breathing the dust. Wear an approved respirator. If you use solvent or paint stripper, remove stripper with soap and water before welding. Remove solvent or paint stripper containers and other flammable material from area. Allow fumes to disperse at least 15 minutes before welding or heating.

WARNING!



END OF LIFE DISPOSAL

At the completion of the useful life of the unit, drain all fluids and dismantle by separating the different materials (rubber, steel, plastic, etc.). Follow all federal, state and local regulations for recycling and disposal of the fluid and components.



OPERATING THE 4-IN-1 MULTI-PURPOSE BUCKET

- Do not exceed the lifting capacity of your prime mover.
- Operate only from the operator's station.
- When operating on slopes, drive up and down, not across. Avoid steep hillside operation, which could cause the prime mover to overturn.
- Reduce speed when driving over rough terrain, on a slope, or turning, to avoid overturning the vehicle.
- An operator must not use drugs or alcohol, which can change his or her alertness or coordination. An operator taking prescription or over-the-counter drugs should seek medical advice on whether or not he or she can safely operate equipment.
- Before exiting the prime mover, lower the attachment to the ground, turn off the prime mover's engine, remove the key and apply the brakes.
- Never heap load heavy material where the combined weight of the bucket and material could exceed the rated lifting capacity of the loader.
- Be sure the load does not stick out too far in front of the bucket. A light load sticking out too far can have the same tipping effect as a heavy load carried in close.
- When using the clam, lift the load slightly and make sure that the load is secure. If the load appears to be unstable, lower the load, open the clam and reposition the load to attain full stability.

EQUIPMENT SAFETY PRECAUTIONS



TRANSPORTING THE 4-IN-1 MULTI-PURPOSE BUCKET

- Travel only with the attachment in a safe transport position to prevent uncontrolled movement. Drive slowly over rough ground and on slopes.
- When driving on public roads use safety lights, reflectors, Slow Moving Vehicle signs etc., to prevent accidents. Check local government regulations that may affect you.
- Do not drive close to ditches, excavations, etc., cave in could result.
- Do not smoke when refueling the prime mover. Allow room in the gas tank for expansion. Wipe up any spilled fuel. Secure cap tightly when done.



MAINTAINING THE 4-IN-1 MULTI-PURPOSE BUCKET

- Before performing maintenance, lower the attachment to the ground, turn off the engine, remove the key and apply the brakes.
- Never perform any work on the attachment unless you are authorized and qualified to do so. Always read the operator service manual's before any repair is made. After completing maintenance or repair, check for correct functioning of the attachment. If not functioning properly, always tag "DO NOT OPERATE" until all problems are corrected.
- Worn, damaged, or illegible safety decals must be replaced. New safety decals can be ordered from BRADCO.
- Never make hydraulic repairs while the system is under pressure. Serious personal injury or death could result.
- Never work under a raised attachment.

DECALS

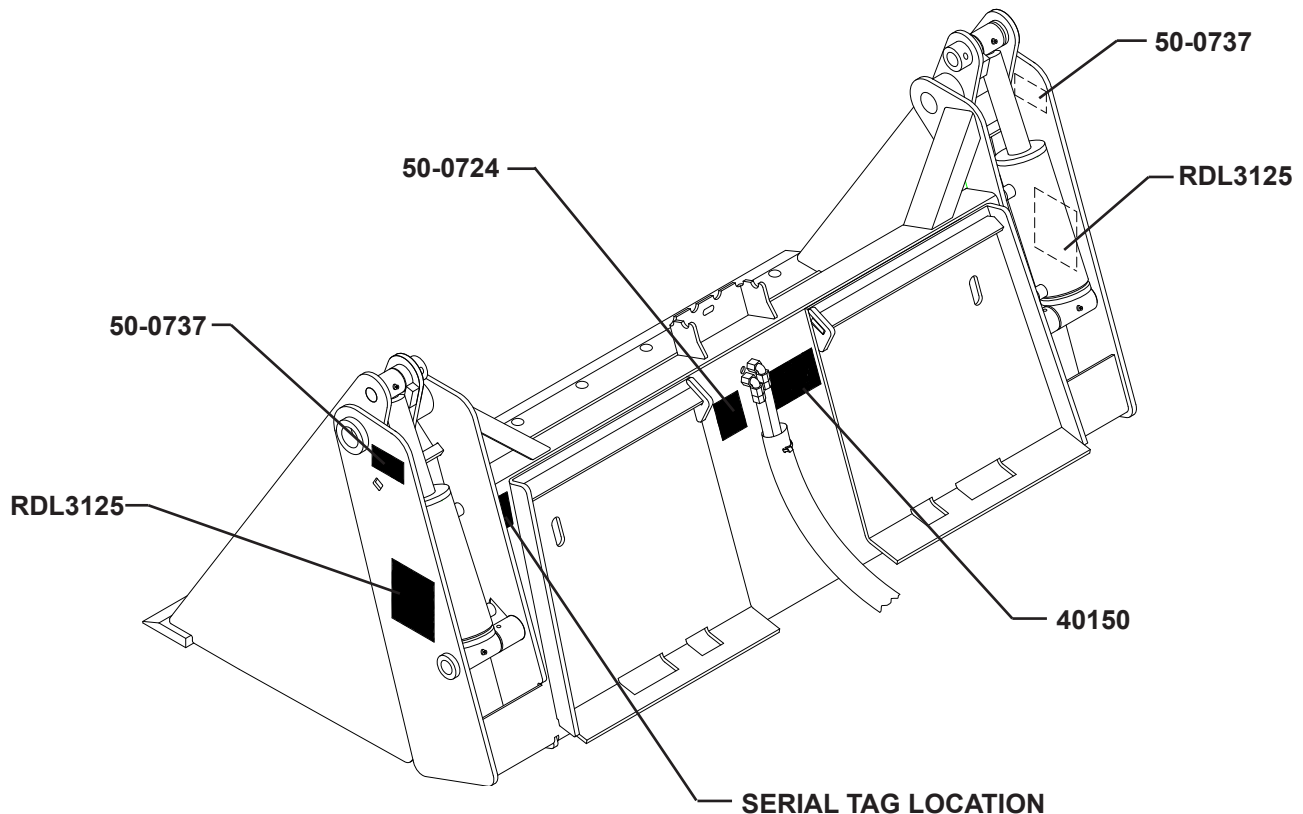
DECAL PLACEMENT

GENERAL INFORMATION

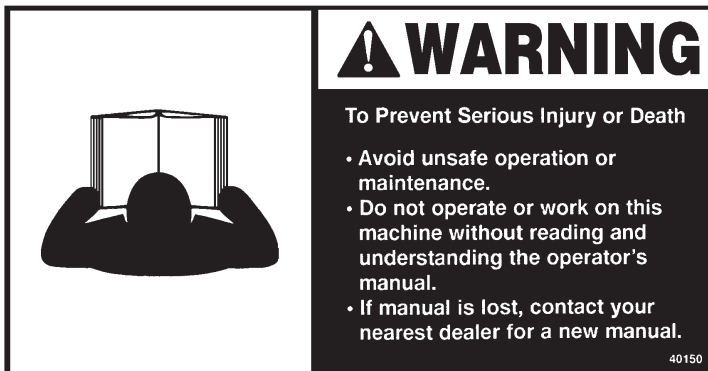
The following diagrams show the location of all the decals used on your attachment. The decals are identified by their part numbers, with the reductions of the actual decals shown on the following pages. Use this information to order replacements for lost or damaged decals. Be sure you understand all decals before operating the attachment. They contain information you need to know for attachment safety. (See decal explanations.)

IMPORTANT: Keep all safety decals clean and legible. Replace all missing, or damaged safety decals. When replacing parts with safety decals attached, the safety decals must also be replaced.

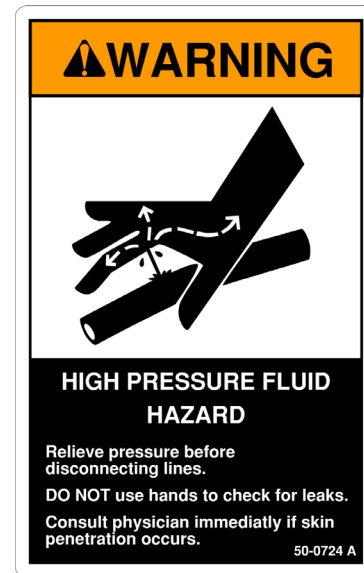
REPLACING SAFETY DECALS: Clean the area of application with a nonflammable solvent, then wash the same area with soap and water. Allow the surface to dry. Remove the backing from the safety decal, exposing the adhesive surface. Apply the safety decal to the position shown in the diagram, and smooth out any bubbles.



DECALS



PART #40150
WARNING! READ OPERATOR'S MANUAL



PART #50-0724
WARNING! HIGH PRESSURE FLUID



PART #50-0737
WARNING! PINCH POINT HAZARD



PART #RDL3125
WARNING! CRUSH HAZARD

INSTALLATION AND OPERATION

WARNING! Improper attachment of the 4N1 Bucket could result in injury or death. Do not operate this product until you have positive indication that the attachment is securely mounted.



GENERAL INFORMATION

The FFC 4N1 buckets were designed to be used on various prime movers with various different horsepower, operating capacities and lifting capacities. Before installing the attachment you have received onto your prime mover, verify that your attachment is compatible with your prime mover. Check to be certain each unit is within the limitations of the other. Operating the attachment on a prime mover that exceeds any of the recommended specifications will cause damage to the attachment and void all warranties.

Due to the different prime movers that these attachments can be mounted on, the hydraulic power and return hoses and couplers vary according to the prime mover. These can be purchased from your local dealer if they were not supplied with your attachment.

HOSE REQUIREMENTS

Power and return hoses and couplers may be purchased from your dealer to install the attachment onto your prime mover. The hoses must be long enough to accommodate for complete roll out of the attachment, rated for the maximum hydraulic pressure of your prime mover's hydraulic system and a minimum of .25" in diameter.

INSTALLATION

Install the attachment by following your power units operator's manual for installing an attachment.

WARNING! To avoid serious personal injury, make sure the attachment is securely latched to the attachment mechanism of your unit. Failure to do so could result in separation of the attachment from the prime mover.



Install the power and return hoses to the fittings on the bucket followed by the couplers. Connect the hydraulic quick couplers to the auxiliary hydraulics and route the hoses in such a fashion as to prevent chafing or pinching, and secure in place wherever necessary.

Start engine and slowly cycle the cylinder(s) several times to purge system of air. Check for proper hydraulic connection, hose routing and hose length.

NOTE: Power and return hoses must be long enough to accommodate complete rollout of the bucket.

Check the assembly for proper assembly, installation and hydraulic leaks.

INSTALLATION AND OPERATION

DETACHING

On firm level ground, close the clam and lower the loader arms until the attachment is on the ground.

Turn off the engine. Move control levers back and forth to relieve pressure in the line. Disconnect couplers.

NOTE: Connect couplers together or install caps to prevent contaminants from entering the hydraulic system.

Follow your prime mover's operator's manual for detaching (removing) an attachment.

NOTE: Frequent lubrication of grease fittings at the cylinder pivot pins and on each of the bucket pivot points with a multi-purpose grease will greatly increase life of the product.

STORAGE

1. Clean the unit thoroughly, removing all mud, dirt, and grease.
2. Inspect for visible signs of wear, breakage, or damage. Order any parts required and make the necessary repairs to avoid delays when starting next season.
3. Tighten loose nuts, capscrews, and hydraulic connections.
4. Cap hydraulic couplers to protect against contaminants.
5. Touch up all unpainted surfaces with paint, to prevent rust.
6. Coat the exposed portions of the cylinder rods with grease.
7. Store the unit in a dry and protected place. Leaving the unit outside will materially shorten its life.

Additional Precautions for Long Term Storage:

- Touch up all unpainted surfaces with paint to prevent rust.

REMOVAL FROM STORAGE

- Remove cover.
- Wash unit and replace any damaged and/or missing parts.
- Lubricate grease fittings.
- Check hydraulic hoses for damage and replace as necessary.

LIFT POINTS

Lifting points are identified by lifting decals where required. Lifting at other points is unsafe and can damage attachment. Do not attach lifting accessories around cylinders or in any way that may damage hoses or hydraulic components.

- Attach lifting accessories to unit at recommended lifting points.
- Bring lifting accessories together to a central lifting point.
- Lift gradually, maintaining the equilibrium of the unit.

LIFT POINTS VARY PER MODEL. WHEN LIFTING DECALS ARE NOT PRESENT, VERIFY THAT LIFTING ACCESSORIES ARE SECURELY ATTACHED AND UNIT IS STABLE BEFORE LIFTING.

INSTALLATION AND OPERATION

WARNING! Use lifting accessories (chains, slings, ropes, shackles and etc.) that are capable of supporting the size and weight of your attachment. Secure all lifting accessories in such a way to prevent unintended disengagement. Failure to do so could result in the attachment falling and causing serious personal injury or death.



TIE DOWN POINTS

Tie down points are identified by tie down decals where required. Securing to trailer at other points is unsafe and can damage attachment. Do not attach tie down accessories around cylinders or in any way that may damage hoses or hydraulic components.

- Attach tie down accessories to unit as recommended.
- Check unit stability before transporting.
-

TIE DOWN POINTS VARY PER MODEL. WHEN TIE DOWN DECALS ARE NOT PRESENT, VERIFY THAT TIE DOWN ACCESSORIES ARE SECURELY ATTACHED AND UNIT IS STABLE BEFORE TRANSPORTING.

WARNING! Verify that all tie down accessories (chains, slings, ropes, shackles and etc.) are capable of maintaining attachment stability during transporting and are attached in such a way to prevent unintended disengagement or shifting of the unit. Failure to do so could result in serious personal injury or death.



TRANSPORTING

Follow all local government regulations that may apply along with recommended tie down points and any equipment safety precautions at the front of this handbook when transporting your attachment.

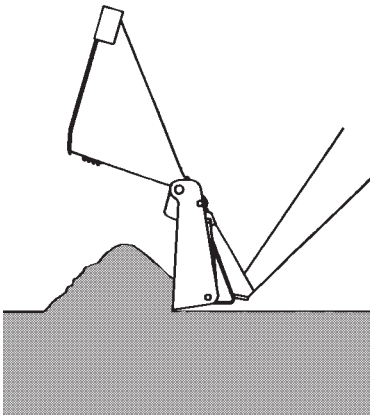
Standard Bucket Operations: Fully close clam against the blade and this product can be used as a standard bucket. When dumping into a truck or similar application, this product can dump at a greater height than a standard bucket by opening the clam to release the material.

Bulldozing Operations: With the clam fully open, tilt the blade forward so that the bottom of the cutting edge penetrates at the desired depth for moving or leveling the material.

Back-Dragging Operations: With the clam fully open, tilt the blade forward so that the back cutting edge of the clam is on the ground and the blade is off the ground. The angle of the back cutting edge of the clam permits the operator to cut sod or other vegetation.

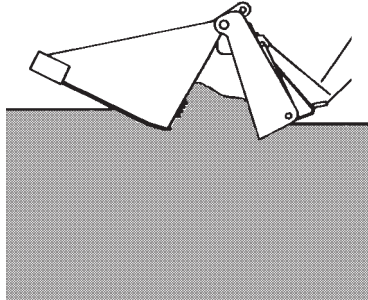
Grapple Operations: Open the clam sufficiently to clear the object being lifted. Lower bucket so that the object is between the clam and the blade. Close the clam as completely as practical for the object being lifted and slowly begin lifting. If the object appears to be unstable or not balanced, lower back to the ground and repeat this process until the object remains stable during the entire lifting and moving process. Always lower the object to a stable position on the ground before opening the clam.

4-IN-1 MULTI-PURPOSE BUCKET APPLICATIONS



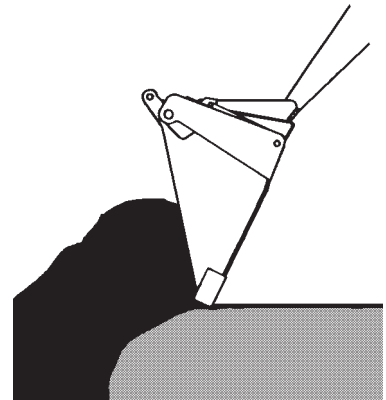
BULLDOZING

For all industry uses: road maintenance, clean up, grading, etc.



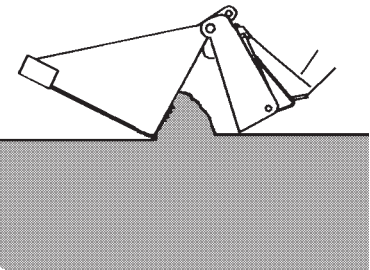
CLAM

Handles the hard to pick up material with ease. Complete control of loading.



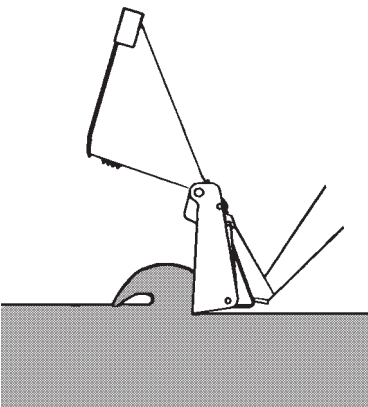
BACKFILLING

Backfilling is no problem.



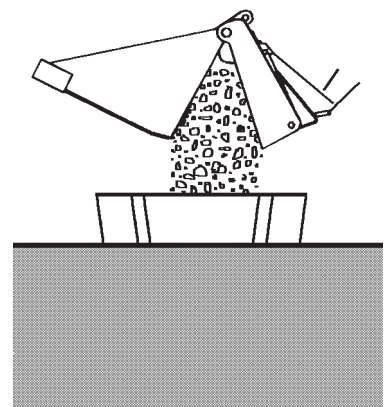
BACKDRAG

For working in close quarters such as between buildings and among trees.



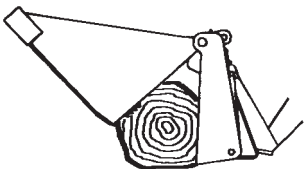
SCRAPING

Cleaning yards, leveling lawns: a landscaper's bucket.



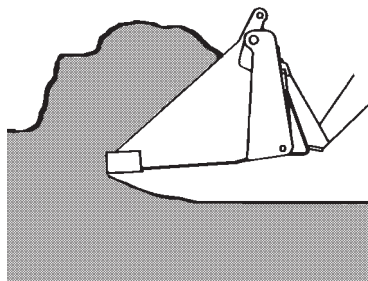
BOTTOM DUMPING

Ideal for trench filling or dumping into a container.



GRAB

Handles all undesirable loading: brush, timbers and all bulky materials.



DIGGING

Same as all conventional buckets.

MAINTENANCE

MAINTENANCE SCHEDULE

Procedure	Daily	Every 40 Hours
Check all bolts and nuts for tightness	✓	
Replace any missing bolts or nuts with approved replacement parts	✓	
Check hydraulic system for hydraulic oil leaks. see procedure below.	✓	
Visually inspect the machine for worn parts or cracked welds, and repair as necessary.	✓	
Lubricate all grease fittings		✓

Oil Cleanliness Requirements

IMPORTANT - All hydraulic fluid shall be filtered before use in any FFC product to obtain the ISO cleanliness standard of 20/18/15. Unless explicitly specified otherwise.

Fittings/Hoses Inspection Guidelines

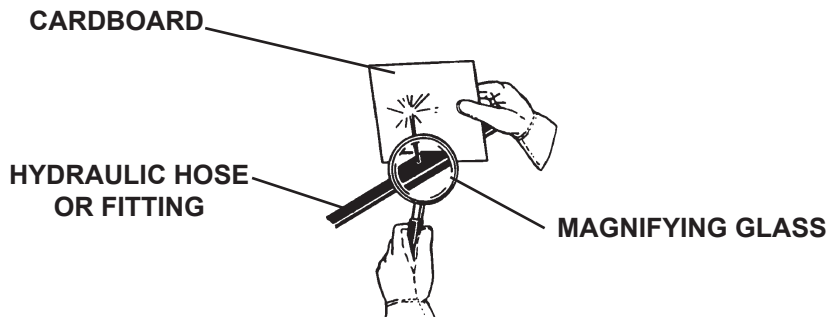
Stop the prime mover engine and release hydraulic pressure before servicing or adjusting hydraulic system.

WARNING! Escaping fluid under pressure can have sufficient force to penetrate the skin, causing serious personal injury. Fluid escaping from a very small hole can be almost invisible. Use a piece of cardboard or wood, rather than hands, to search for suspected leaks.



Keep unprotected body parts, such as face, eyes, and arms as far away as possible from a suspected leak. Flesh injected with hydraulic fluid may develop gangrene or other permanent disabilities.

If injured by injected fluid, see a doctor at once. If your doctor is not familiar with this type of injury, ask him to research it immediately to determine proper treatment.



IMPORTANT: When replacing parts, use only factory approved replacement parts. Manufacturer will not claim responsibility for use of unapproved parts or accessories, and/or other damages as a result of their use.

MAINTENANCE AND SERVICE

CYLINDER SEAL REPLACEMENT

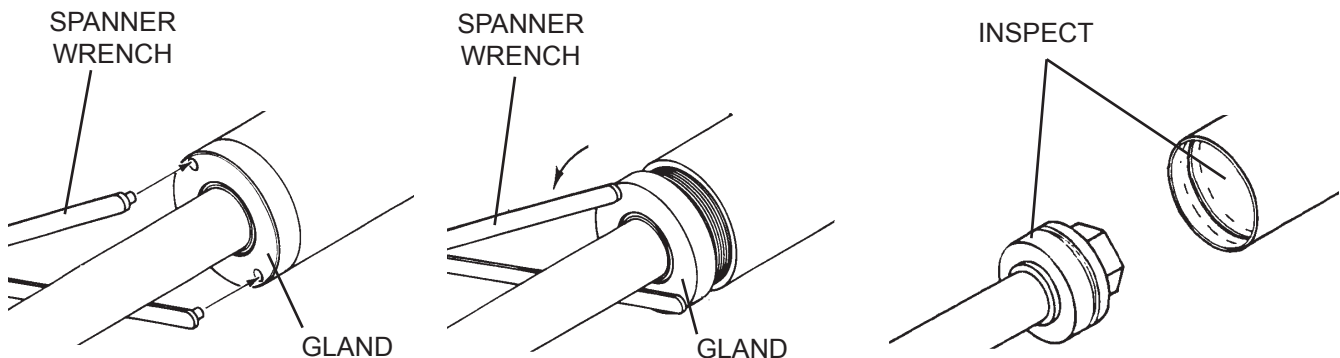
The following information is provided to assist you in the event you should need to repair or rebuild a hydraulic cylinder. When working on hydraulic cylinders, make sure that the work area and tools are clean and free of dirt to prevent contamination of the hydraulic system and damage to the hydraulic cylinders. Always protect the active part of the cylinder rod (the chrome section). Nicks or scratches on the surface of the rod could result in cylinder failure. Clean all parts thoroughly with a cleaning solvent before reassembly.

DISASSEMBLY PROCEDURE

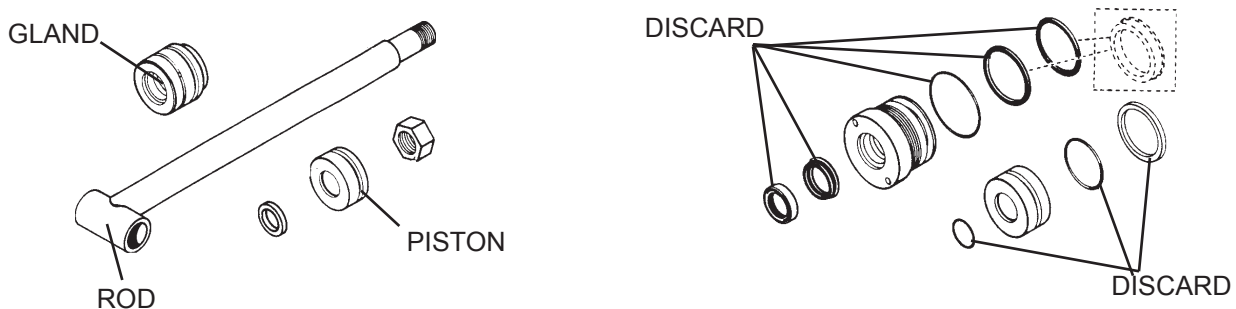
IMPORTANT: Do not contact the active surface of the cylinder rod with the vise. Damage to the rod could result.

THREADED TYPE GLAND

1. Rotate the gland with a spanner wrench counterclockwise until the gland is free of the cylinder tube.
2. Pull the cylinder rod from the cylinder tube and inspect the piston and the bore of the cylinder tube for deep scratches or galling. If damaged, the piston AND the cylinder tube must be replaced.



3. Remove the hex nut, piston, flat washer or spacer tube (if so equipped), and gland from the cylinder rod. If the cylinder rod is rusty, scratched, or bent, it must be replaced.
4. Remove and discard all the old seals.



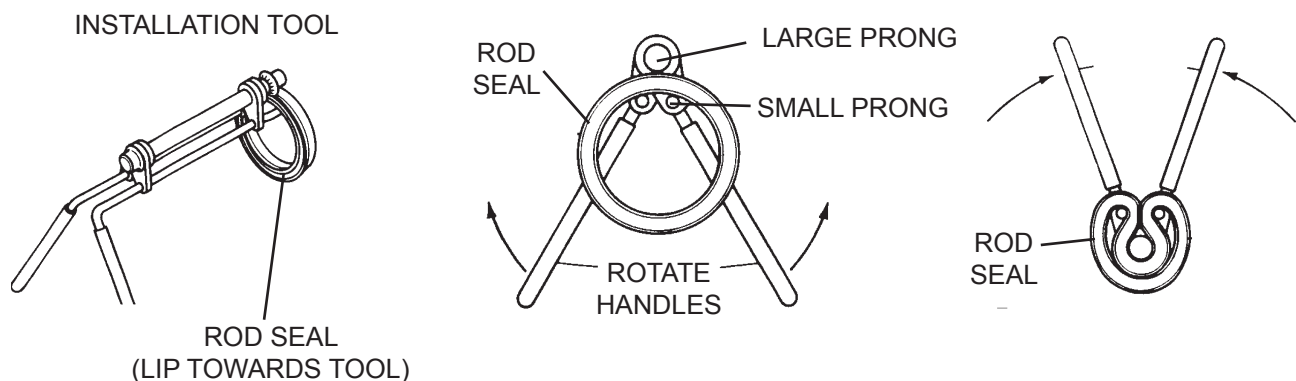
MAINTENANCE AND SERVICE

ASSEMBLY PROCEDURE

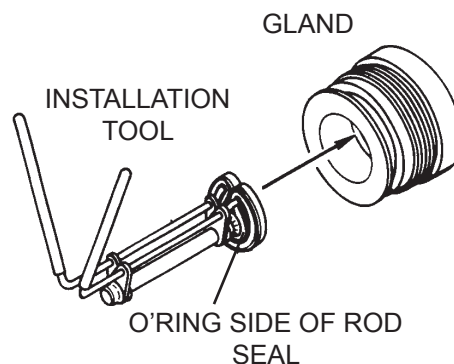
IMPORTANT: Replace all seals even if they do not appear to be damaged. Failure to replace all seals may result in premature cylinder failure. **NOTE:** Seal kits will service most cylinders of similar bore size and rod diameter.

1. Install the cylinder rod seal in the gland first. Be careful not to damage the seal in the process, as it is somewhat difficult to install.

NOTE: A special installation tool (Part #65349) is available to help with installing the seal. Simply fit the end of the tool over the seal so that the large prong of the tool is on the outside of the seal, and the two smaller prongs on the inside. The lip of the seal should be facing towards the tool. Rotate the handles on the tool around to wrap the seal around the end of the tool.

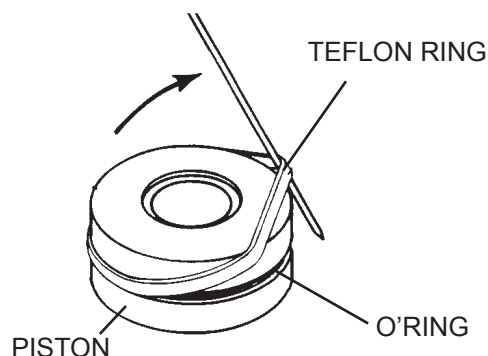


Now insert the seal into the gland from the inner end. Position the seal in its groove, and release and remove the tool. Press the seal into its seat the rest of the way by hand.



2. Install the new piston ring, rod wiper, O-rings and backup washers, if applicable, on the piston.

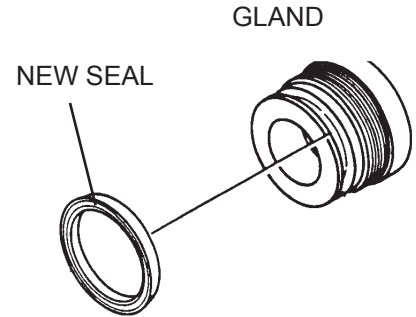
Be careful not to damage the seals. Caution must be used when installing the piston ring. The ring must be stretched carefully over the piston with a smooth, round, pointed tool.



MAINTENANCE AND SERVICE

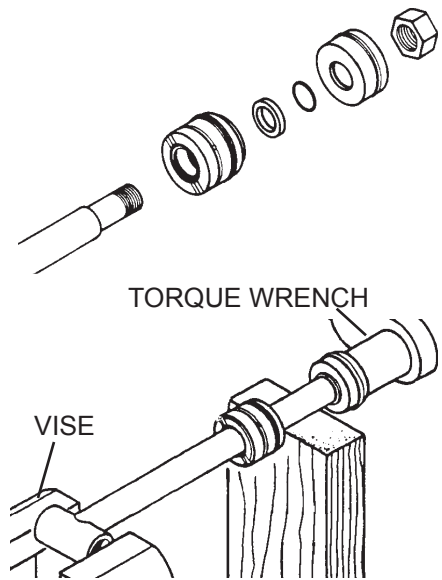
- After installing the rod seal inside the gland, as shown in step #1, install the external seal.

NOTE: Threaded glands may have been equipped with a separate O-ring and backup washer system or a polypak (all in one) type seal. Current seal kits contain a polypak (all in one) type seal to replace the discarded seal types on ALL THREADED GLANDS.



- Slide the gland onto the cylinder rod, being careful not to damage the rod wiper. Then install the spacer, or flat washer (if so equipped), small o-ring, piston, and hex nut onto the end of the cylinder rod.
- Secure the cylinder rod (mounting end) in a vise with a support at its center. Torque the nut to the amount shown for the thread diameter of the cylinder rod (see chart).

Thread Diameter	POUNDS - FEET	NEWTON-METERS
7/8"	150-200	203.4-271.2
*1"	230-325	311.8-440.6
1-1/8"	350-480	474.5-650.8
1-1/4"	490-670	664.4-908.4
1-3/8"	670-900	908.4-1 220.2
* 1" Thread Diameter WITH 1-1/4" Rod Diameter		
Min. 230 ft. lbs. (311.8 N·m) Max. 250 ft. lbs. (339.0 N·m)		



IMPORTANT: Do not contact the active surface of the cylinder rod with the vise. Damage to the rod could result.

- Apply a lubricant (such as Lubriplate #105) to the piston and teflon ring. Insert the cylinder rod assembly into the cylinder tube.

IMPORTANT: Ensure that the piston ring fits squarely into the cylinder tube and piston groove, otherwise the ring may be damaged and a leak will occur.

- Use a spanner wrench to rotate the gland clockwise into the cylinder. Continue to rotate the gland with the spanner wrench until it is tight.

WARNING! Cylinders serviced in the field are to be tested for leakage prior to the attachment being placed in work. Failure to test rebuilt cylinders could result in damage to the cylinder and/or the attachment, cause severe personal injury or even death.



SPECIFICATIONS

IMPORTANT



Exceeding any of the maximum recommended prime mover specifications **CAN** result in damage to this product and **WILL** void all FFC warranties.

DESCRIPTION	SPECIFICATIONS	
4-IN-1 BUCKETS	Construction	H.D. Construction
Weight of Prime Mover without 4-in-1 Bucket	11,000 lbs. maximum	20,000 lbs. maximum
Lift Capacity of Prime Mover's Loader	9,000 lbs. maximum	10,000 lbs. maximum
Operating Capacity of Prime Mover's Loader	4,500 lbs. maximum	5,000 lbs. maximum
Hydraulic Pressure Output	4,000 psi maximum	
Rear Ballast	As required to maintain full prime mover stability. (Note the shipping weight of your model, then see the operator's manual(s) for your prime mover and loader for ballasting needs.)	

ATTACHMENT SPECIFICATIONS

Model Number	Overall Width	Overall Height	Overall Depth	Weight
CONSTRUCTION				
LAF0975	73.88"	25.75"	36.88"	1170#
LAF0976	73.88"	28.5"	36.19"	1170#
LAF0980	78.88"	25.75"	36.88"	1255#
LAF0977	78.88"	28.5"	36.19"	1255#
LAF0984	82.88"	25.75"	36.88"	1320#
LAF0985	82.88"	28.5"	36.19"	1320#
LAF0986	84.88"	25.75"	36.88"	1350#
LAF0988	84.88"	28.5"	36.19"	1350#
LAF0989	87.88"	25.75"	36.88"	1400#
LAF0990	87.88"	28.5"	36.19"	1400#
LAF0991	90.88"	25.75"	36.88"	1435#
LAF0992	90.88"	28.5"	36.19"	1435#
HEAVY DUTY CONSTRUCTION				
LAF3182	82.25"	36.44"	34.88"	1100#
LAF3190	90.25"	36.44"	34.88"	1275#
LAF3196	96.25"	36.44"	34.88"	1450#
All replacement hydraulic hoses and fittings must have a minimum rated working pressure of 4,000 psi.				

BOLT TORQUE

BOLT TORQUE SPECIFICATIONS

GENERAL TORQUE SPECIFICATION TABLES

Use the following charts when determining bolt torque specifications when special torques are not given. Always use grade 5 or better when replacing bolts.

SAE BOLT TORQUE SPECIFICATIONS

NOTE: The following torque values are for use with extreme pressure lubricants, plating or hard washer applications. Increase torque 15% when using hardware that is unplated and either dry or lubricated with engine oil.

Bolt Size		SAE GRADE 5 TORQUE				SAE GRADE 8 TORQUE				Bolt head identification marks as per grade. NOTE: Manufacturing Marks Will Vary
		Pounds Feet		Newton-Meters		Pounds Feet		Newton-Meters		
Inches	Millimeters	UNC	UNF	UNC	UNF	UNC	UNF	UNC	UNF	
1/4	6.35	8	9	11	12	10	13	14	18	
5/16	7.94	14	19	19	23	20	25	27	34	
3/8	9.53	30	36	41	49	38	46	52	62	
7/16	11.11	46	54	62	73	60	71	81	96	
1/2	12.70	68	82	92	111	94	112	127	152	
9/16	14.29	94	112	127	152	136	163	184	221	
5/8	15.88	128	153	174	207	187	224	254	304	
3/4	19.05	230	275	312	373	323	395	438	536	
7/8	22.23	340	408	461	553	510	612	691	830	
1	25.40	493	592	668	803	765	918	1037	1245	
1-1/8	25.58	680	748	922	1014	1088	1224	1475	1660	
1-1/4	31.75	952	1054	1291	1429	1547	1700	2097	2305	
1-3/8	34.93	1241	1428	1683	1936	2023	2312	2743	3135	
1-1/2	38.10	1649	1870	2236	2535	2686	3026	3642	4103	

GRADE 2



GRADE 5



GRADE 8



METRIC BOLT TORQUE SPECIFICATIONS

NOTE: The following torque values are for use with metric hardware that is unplated and either dry or lubricated with engine oil. Reduce torque 15% when using hardware that has extreme pressure lubricants, plating or hard washer applications.

Bolt head identification marks as per grade.		
		

Size of Bolt	Grade No.	Pitch (mm)	Pounds Feet	Newton-Meters	Pitch (mm)	Pounds Feet	Newton-Meters
M6	5.6	1.0	3.6-5.8	4.9-7.9	-	-	-
	8.8		5.8-4	7.9-12.7		-	-
	10.9		7.2-10	9.8-13.6		-	-
M8	5.6	1.25	7.2-14	9.8-19	1.0	12-17	16.3-23
	8.8		17-22	23-29.8		19-27	25.7-36.6
	10.9		20-26	27.1-35.2		22-31	29.8-42
M10	5.6	1.5	20-25	27.1-33.9	1.25	20-29	27.1-39.3
	8.8		34-40	46.1-54.2		35-47	47.4-63.7
	10.9		38-46	51.5-62.3		40-52	54.2-70.5
M12	5.6	1.75	28-34	37.9-46.1	1.25	31-41	42-55.6
	8.8		51-59	69.1-79.9		56-68	75.9-92.1
	10.9		57-66	77.2-89.4		62-75	84-101.6
M14	5.6	2.0	49-56	66.4-75.9	1.5	52-64	70.5-86.7
	8.8		81-93	109.8-126		90-106	122-143.6
	10.9		96-109	130.1-147.7		107-124	145-168
M16	5.6	2.0	67-77	90.8-104.3	1.5	69-83	93.5-112.5
	8.8		116-130	157.2-176.2		120-138	162.6-187
	10.9		129-145	174.8-196.5		140-158	189.7-214.1
M18	5.6	2.0	88-100	119.2-136	1.5	100-117	136-158.5
	8.8		150-168	203.3-227.6		177-199	239.8-269.6
	10.9		175-194	237.1-262.9		202-231	273.7-313
M20	5.6	2.5	108-130	146.3-176.2	1.5	132-150	178.9-203.3
	8.8		186-205	252-277.8		206-242	279.1-327.9
	10.9		213-249	288.6-337.4		246-289	333.3-391.6

Limited Warranty

Except for the Excluded Products as described below, all new products are warranted to be free from defects in material and/or workmanship during the Warranty Period, in accordance with and subject to the terms and conditions of this Limited Warranty.

1. Excluded Products. The following products are excluded from this Limited Warranty:

(a) Any cable, part that engages with the ground (i.e. sprockets), digging chain, bearing, teeth, tamping and/or demolition head, blade cutting edge, pilot bit, auger teeth and broom brush that either constitutes or is part of a product.

(b) Any product, merchandise or component that, in the opinion of Paladin Light Construction¹, has been (i) misused; (ii) modified in any unauthorized manner; (iii) altered; (iv) damaged; (v) involved in an accident; or (vi) repaired using parts not obtained through Paladin Light Construction.

2. Warranty Period. The Limited Warranty is provided only to those defects that occur during the Warranty Period, which is the period that begins on the first to occur of: (i) the date of initial purchase by an end-user, (ii) the date the product is first leased or rented, or (iii) the date that is six (6) months after the date of shipment by Paladin Light Construction as evidenced by the invoiced shipment date (the "Commencement Date") and ends on the date that is twelve (12) months after the Commencement Date.

3. Terms and Conditions of Limited Warranty. The following terms and conditions apply to the Limited Warranty hereby provided:

(a) Option to Repair or Replace. Paladin Light Construction shall have the option to repair or replace the product.

(b) Timely Repair and Notice. In order to obtain the Limited Warranty, (i) the product must be repaired within thirty (30) days from the date of failure, and (ii) a claim under the warranty must be submitted to Paladin Light Construction in writing within thirty (30) days from the date of repair.

(c) Return of Defective Part or Product. If requested by Paladin Light Construction, the alleged defective part or product shall be shipped to Paladin Light Construction at its manufacturing facility or other location specified by Paladin Light Construction, with freight PRE-PAID by the claimant, to allow Paladin Light Construction to inspect the part or product.

Claims that fail to comply with any of the above terms and conditions shall be denied.

LIMITATIONS AND EXCLUSIONS.

THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING WITHOUT LIMITATION THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND ANY WARRANTY BASED ON A COURSE OF DEALING OR USAGE OF TRADE.

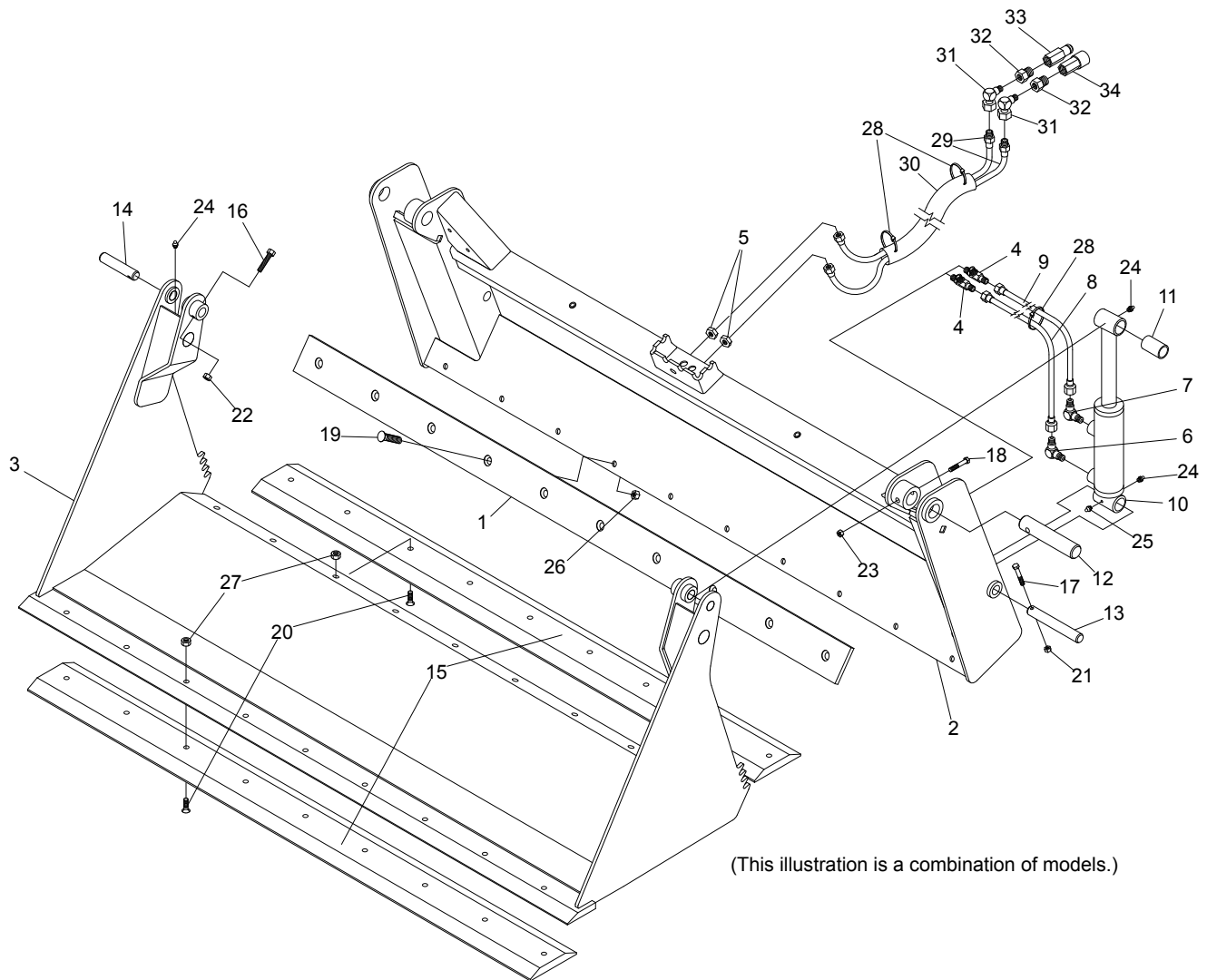
IN NO EVENT SHALL PALADIN LIGHT CONSTRUCTION BE LIABLE FOR CONSEQUENTIAL OR SPECIAL DAMAGES.

IN NO EVENT SHALL PALADIN LIGHT CONSTRUCTION BE LIABLE FOR ANY LOSS OR CLAIM IN AN AMOUNT IN EXCESS OF THE PURCHASE PRICE, OR, AT THE OPTION OF PALADIN LIGHT CONSTRUCTION, THE REPAIR OR REPLACEMENT, OF THE PARTICULAR PRODUCT ON WHICH ANY CLAIM OF LOSS OR DAMAGE IS BASED. THIS LIMITATION OF LIABILITY APPLIES IRRESPECTIVE OF WHETHER THE CLAIM IS BASED ON BREACH OF CONTRACT, BREACH OF WARRANTY, NEGLIGENCE OR OTHER CAUSE AND WHETHER THE ALLEGED DEFECT IS DISCOVERABLE OR LATENT.

¹Attachment Technologies Inc., a subsidiary of Paladin Brands Holding, Inc. (PBHI) is referred to herein as Paladin Light Construction.

February 10, 2010

4-IN-1 CONSTRUCTION BUCKET ASSEMBLY



(This illustration is a combination of models.)

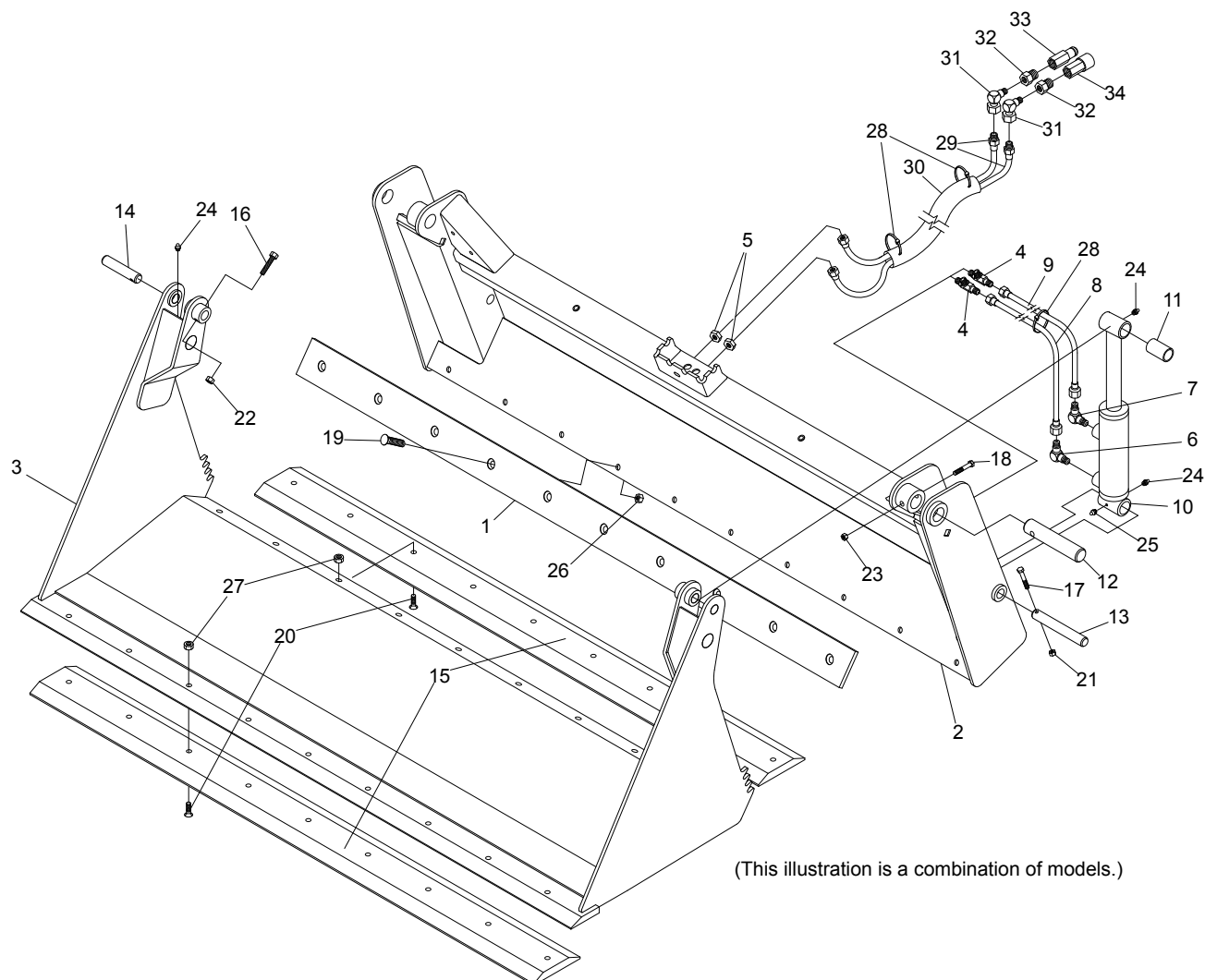
4-IN-1 CONSTRUCTION BUCKET ASSEMBLY

ITEM	QTY	LAF0975 73" 60°	LAF0976 73" 75°	LAF0980 78" 60°	LAF0977 78" 75°	DESCRIPTION
1	1	LAF9946	LAF9946	LAF9934	LAF9934	Single Bevel Cutting Edge .50" x 4"
2	1	LAF0938	LAF0934	LAF0940	LAF0907	Back Blade
3	1	LAF0937	LAF0933	LAF0939	LAF0908	Clam
4	2				30379	Tee Bulkhead Run 6MJ-6MJ-6MJ
5	2				3217	Jam Nut #6
6	2				3434	90° Elbow 6MBO-6MJ
7	2				3434	90° Elbow 6MBO-6MJ
8	2	37520	37520	38324	38324	Hose .25" x length 6FJ-6FJ
9	2	LAF4457	LAF4457	37867	37867	Hose .25" x length 6FJ-6FJ 90°
10	2				LAF4639	Cylinder Assembly
11	2				LAF9401	Bushing 1.00" x 1.25" x 2.00"
12	2				LAF9813	Pivot Pin
13	2				LAF9814	Cylinder Pin
14	2				LAF9815	Cylinder Pin
15	2	LAF9944	LAF9944	LAF9935	LAF9935	Double Bevel Cutting Edge .75" x 6"
16	2				1048	.38" UNC x 2.25" Hex Capscrew
17	2				1048	.38" UNC x 2.25" Hex Capscrew
18	2				1098	.50" UNC x 3.50" Hex Capscrew
19	varies	(9)	(9)	(10)	(10) 10150	.62" UNC x 2" Plow Bolt - Grade 8
20	varies	(18)	(18)	(20)	(20) RHW2765	.75" UNC x 2" Plow Bolt - Grade 8
21	2				1837	.38" UNC Deformed Lock Nut
22	2				1837	.38" UNC Deformed Lock Nut
23	2				1841	.50" UNC Deformed Lock Nut
24	6				6616	Grease Zerk
25	2				6616	Grease Zerk
26	varies	(9)	(9)	(10)	(10) RHW7651	.62" UNC Hex Nut - Grade 8
27	varies	(18)	(18)	(20)	(20) RHW7751	.75" UNC Hex Nut - Grade 8
28	2				7104	Nylon Cable Ties
*29	2				LAF4366	Hydraulic Hose
*30	1				LAF4247	Hydraulic Hose Protector 1-7/8"
*31	2				3430	90° Elbow (Not required for all models)
*32	2				30198	Adapter (Not required for all models)
*33	1				19632	Male Quick Coupler
*34	1				22518	Female Quick Coupler

NOTE: All parts are the same as LAF0977 except for those parts numbered under other sizes.

*ITEM may vary per Skid Steer -- Contact FFC for correct item.

4-IN-1 CONSTRUCTION BUCKET ASSEMBLY



(This illustration is a combination of models.)

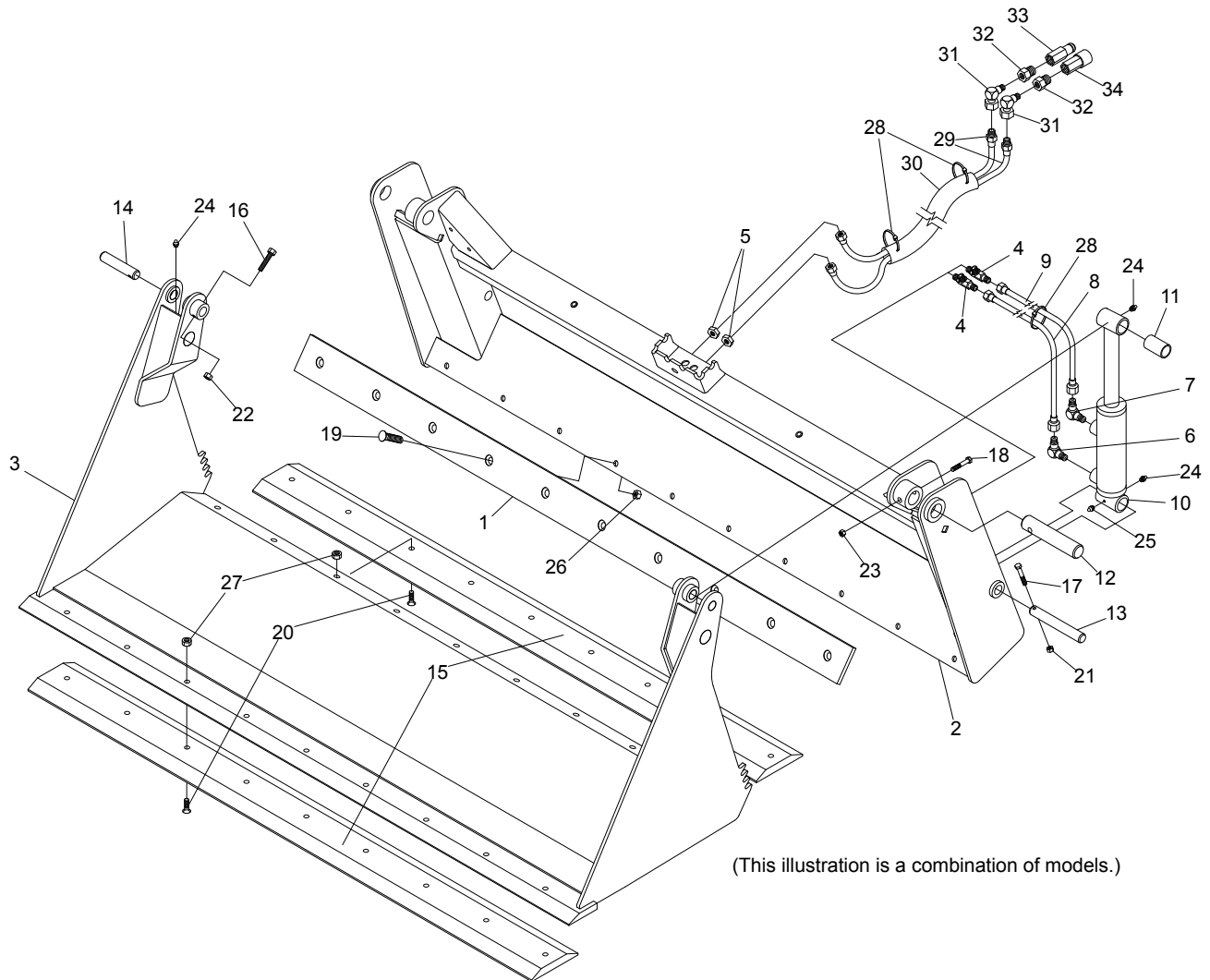
4-IN-1 CONSTRUCTION BUCKET ASSEMBLY

ITEM	QTY	LAF0984 82" 60°	LAF0985 82" 75°	LAF0989 87" 60°	LAF0990 87" 75°	DESCRIPTION
1	1	LAF9953	LAF9953	LAF9945	LAF9945	Single Bevel Cutting Edge .50" x 4"
2	1	LAF0930	LAF0932	LAF0942	LAF0936	Back Blade
3	1	LAF0929	LAF0931	LAF0941	LAF0935	Clam
4	2				30379	Tee Bulkhead Run 6MJ-6MJ-6MJ
5	2				3217	Jam Nut #6
6	2				3434	90° Elbow 6MBO-6MJ
7	2				3434	90° Elbow 6MBO-6MJ
8	2	37733	37733	LAF4460	LAF4460	Hose .25" x length 6FJ-6FJ
9	2	LAF4395	LAF4395	38006	38006	Hose .25" x length 6FJ-6FJ 90°
10	2				LAF4639	Cylinder Assembly
11	2				LAF9401	Bushing 1.00" x 1.25" x 2.00"
12	2				LAF9813	Pivot Pin
13	2				LAF9814	Cylinder Pin
14	2				LAF9815	Cylinder Pin
15	2	LAF9954	LAF9954	LAF9943	LAF9943	Double Bevel Cutting Edge .75" x 6"
16	2				1048	.38" UNC x 2.25" Hex Capscrew
17	2				1048	.38" UNC x 2.25" Hex Capscrew
18	2				1098	.50" UNC x 3.50" Hex Capscrew
19	varies	(10)	(10)	(11)	(11) 10150	.62" UNC x 2.00" Plow Bolt - Grade 8
20	20				RHW2765	.75" UNC x 2.00" Plow Bolt - Grade 8
21	2				1837	.38" UNC Deformed Lock Nut
22	2				1837	.38" UNC Deformed Lock Nut
23	2				1841	.50" UNC Deformed Lock Nut
24	6				6616	Grease Zerk
25	2				6616	Grease Zerk
26	varies	(10)	(10)	(11)	(11) RHW7651	.62" UNC Hex Nut - Grade 8
27	20				RHW7751	.75" UNC Hex Nut - Grade 8
28	2				7104	Nylon Cable Ties
*29	2				LAF4366	Hydraulic Hose
*30	1				LAF4247	Hydraulic Hose Protector 1-7/8"
*31	2				3430	90° Elbow (Not required for all models)
*32	2				30198	Adapter (Not required for all models)
*33	1				19632	Male Quick Coupler
*34	1				22518	Female Quick Coupler

NOTE: All parts are the same as LAF0990 except for those parts numbered under other sizes.

*ITEM may vary per Skid Steer -- Contact FFC for correct item.

4-IN-1 CONSTRUCTION BUCKET ASSEMBLY



(This illustration is a combination of models.)

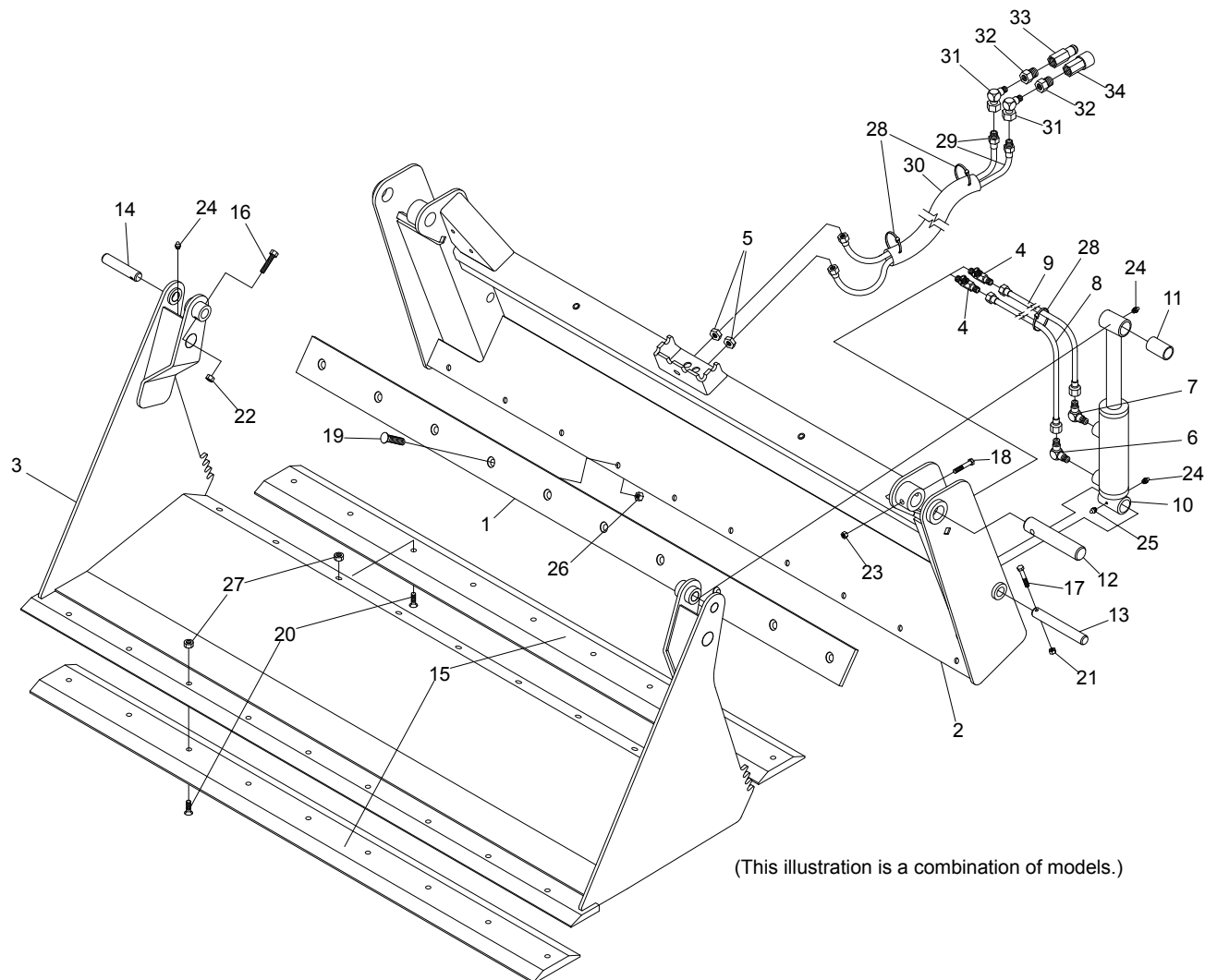
4-IN-1 CONSTRUCTION BUCKET ASSEMBLY

ITEM	QTY	LAF0986 84" 60°	LAF0988 84" 75°	LAF0991 90" 60°	LAF0992 90" 75°	DESCRIPTION
1	1	13-51700	13-51700	13-51750	13-51750	Single Bevel Cutting Edge .50" x 4"
2	1	LAF0959	LAF0958	LAF0964	LAF0962	Back Blade
3	1	LAF0957	LAF0956	LAF0960	LAF0961	Clam
4	2				30379	Tee Bulkhead Run 6MJ-6MJ-6MJ
5	2				3217	Jam Nut #6
6	2				3434	90° Elbow 6MBO-6MJ
7	2				3434	90° Elbow 6MBO-6MJ
8	2	37733	37733	LAF4460	LAF4460	Hose .25" x length 6FJ-6FJ
9	2	LAF4395	LAF4395	38006	38006	Hose .25" x length 6FJ-6FJ 90°
10	2				LAF4639	Cylinder Assembly
11	2				LAF9401	Bushing 1.00" x 1.25" x 2.00"
12	2				LAF9813	Pivot Pin
13	2				LAF9814	Cylinder Pin
14	2				LAF9815	Cylinder Pin
15	2	13-51699	13-51699	13-51749	13-51749	Double Bevel Cutting Edge .75" x 6"
16	2				1048	.38" UNC x 2.25" Hex Capscrew
17	2				1048	.38" UNC x 2.25" Hex Capscrew
18	2				1098	.50" UNC x 3.50" Hex Capscrew
19	11				10150	.62" UNC x 2.00" Plow Bolt - Grade 8
20	20				RHW2765	.75" UNC x 2.00" Plow Bolt - Grade 8
21	2				1837	.38" UNC Deformed Lock Nut
22	2				1837	.38" UNC Deformed Lock Nut
23	2				1841	.50" UNC Deformed Lock Nut
24	6				6616	Grease Zerk
25	2				6616	Grease Zerk
26	11				RHW7651	.62" UNC Hex Nut - Grade 8
27	20				RHW7751	.75" UNC Hex Nut - Grade 8
28	2				7104	Nylon Cable Ties
*29	2				LAF4366	Hydraulic Hose
*30	1				LAF4247	Hydraulic Hose Protector 1-7/8"
*31	2				3430	90° Elbow (Not required for all models)
*32	2				30198	Adapter (Not required for all models)
*33	1				19632	Male Quick Coupler
*34	1				22518	Female Quick Coupler

NOTE: All parts are the same as LAF0992 except for those parts numbered under other sizes.

*ITEM may vary per Skid Steer -- Contact FFC for correct item.

4-IN-1 HEAVY DUTY CONSTRUCTION BUCKET ASSEMBLY



(This illustration is a combination of models.)

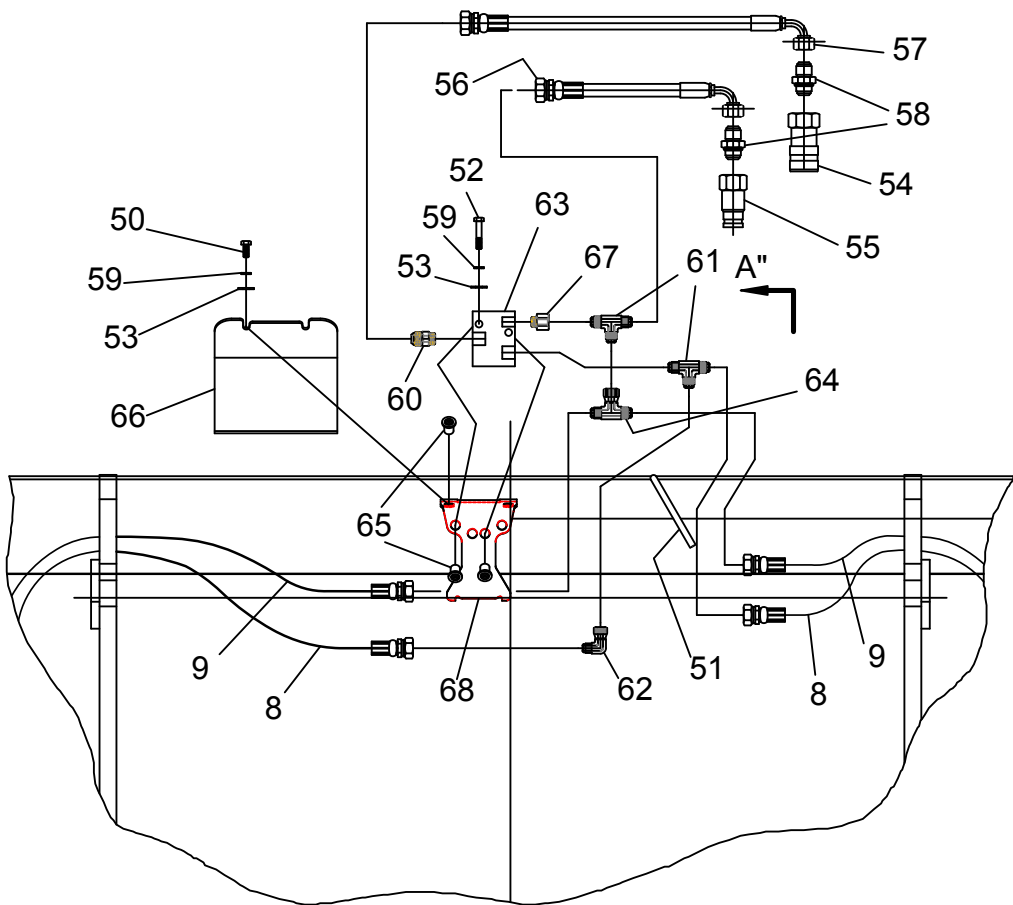
4-IN-1 HEAVY DUTY CONSTRUCTION BUCKET ASSEMBLY

ITEM	QTY	LAF3182 82"	LAF3190 90"	LAF3196 96"	DESCRIPTION
1	Not Used				
2	1	LAF3187	LAF3191	LAF3197	Back Blade
3	1	LAF3186	LAF3192	LAF3198	Clam
4	2			LAF4009	Tee Bulkhead Run 8MJ-8MJ-8MJ
5	2			3203	Jam Nut #8
6	2			3434	90° Elbow 6MBO-6MJ
7	2			3434	90° Elbow 6MBO-6MJ
8	2	LAF4327	LAF4303	37128	Hose .38" x length 6FJ-8FJ
9	2	37429	LAF4355	LAF4327	Hose .38" x length 6FJ-8FJ
10	2			114594	Cylinder Assembly
11	Not Used				
12	2			LAF3183	Pivot Pin
13	2			LAF3098	Cylinder Pin
14	2			LAF3185	Cylinder Pin
15	Not Used				
16	2			RHW8020	Spring Pin Coiled .31" x 2"
17	2			1049	.38" UNC x 2.50" Hex Capscrew
18	2			1098	.50" UNC x 3.50" Hex Capscrew
19	Not Used				
20	Not Used				
21	Not Used				
22	2			1837	.38" UNC Deformed Lock Nut
23	2			1841	.50" UNC Deformed Lock Nut
24	6			6616	Grease Zerk
25	Not Used				
26	Not Used				
27	Not Used				
28	2	Not supplied by FFC.			Nylon Cable Ties .3" x 15.25"
*29	2	Not supplied by FFC.			Hydraulic Hose
*30	1	Not supplied by FFC.			Hydraulic Hose Protector 1-7/8"
*31	2	Not supplied by FFC.			90° Elbow (Not required for all models)
*32	2	Not supplied by FFC.			Adapter (Not required for all models)
*33	1	Not supplied by FFC.			Male Quick Coupler
*34	1	Not supplied by FFC.			Female Quick Coupler

NOTE: All parts are the same as LAF3196 except for those parts numbered under other sizes.

*ITEM may vary per Skid Steer.

PO CHECK VALVE ASSEMBLY

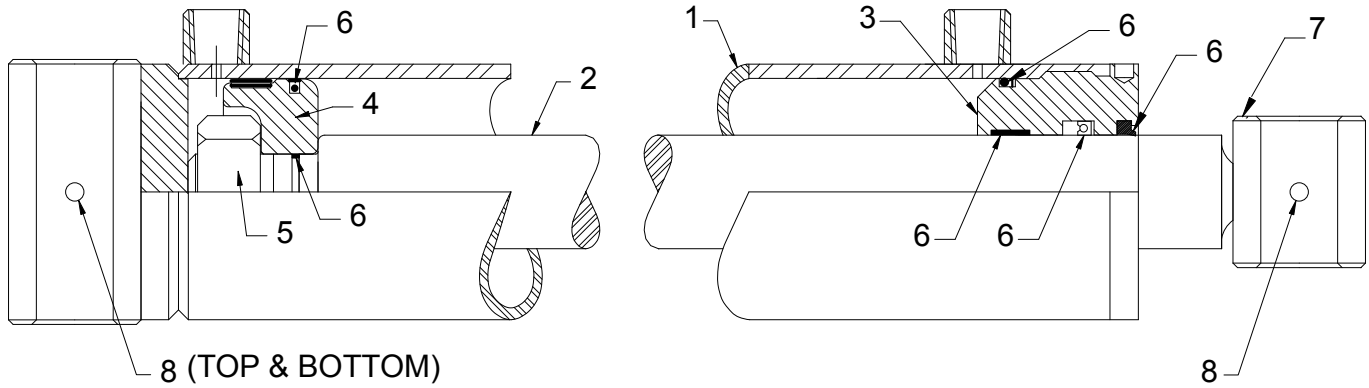


PO CHECK VALVE ASSEMBLY

ITEM	QTY	LAF3182 82"	LAF3190 90"	LAF3196 96"	DESCRIPTION
50	2			1021	.31" UNC x .75" Hex Capscrew
51	1			ILA8232	Quick Coupler Support
52	2			1027	.31" UNC x 2.25" Hex Capscrew
53	4			1513	.31" Flat Washer
54	1	Contact FFC to obtain correct item.			Female Quick Coupler
55	1	Contact FFC to obtain correct item.			Male Quick Coupler
56	1	Contact FFC to obtain correct item.			Hydraulic Hose
57	1	Contact FFC to obtain correct item.			Hydraulic Hose
58	2	Contact FFC to obtain correct item.			Adapter
59	4			1502	.31" Lock Washer
60	1			3103	Adapter 8MBO-8MJ
61	2			30409	Run Tee 8MJ-8MBO-8MJ
62	1			3149	90° Elbow 8MJ-8FJX
63	1			LAF4769	PO Check Valve
64	1			30359	Branch Tee 8MJ-8MJ-8FJX
65	4			10139	Rivet Nut .31"
66	1			LAF8999	Cover
67	1			3337	Adapter 6MBO-8FB
68	1			13-50438	Mounting Plate

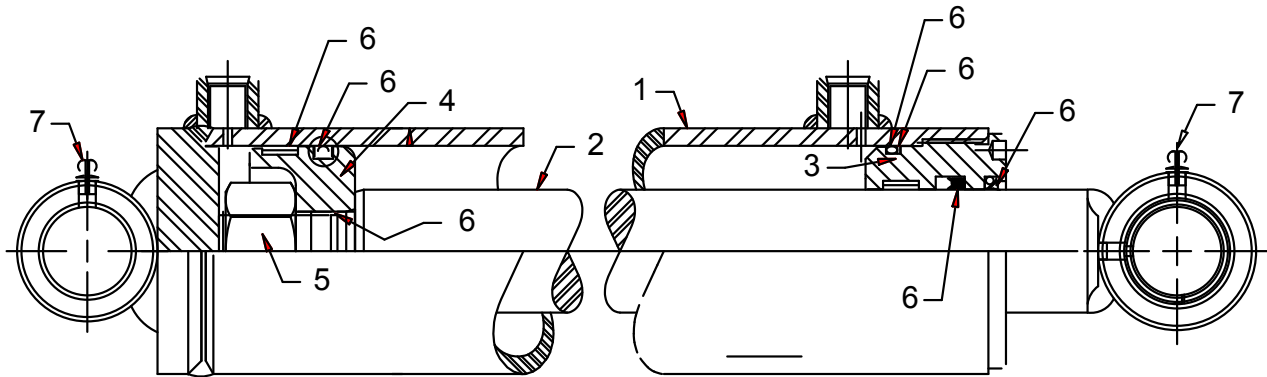
NOTE: All parts are the same as LAF3196 except for those parts numbered under other sizes.

LAF4639 CYLINDER ASSEMBLY



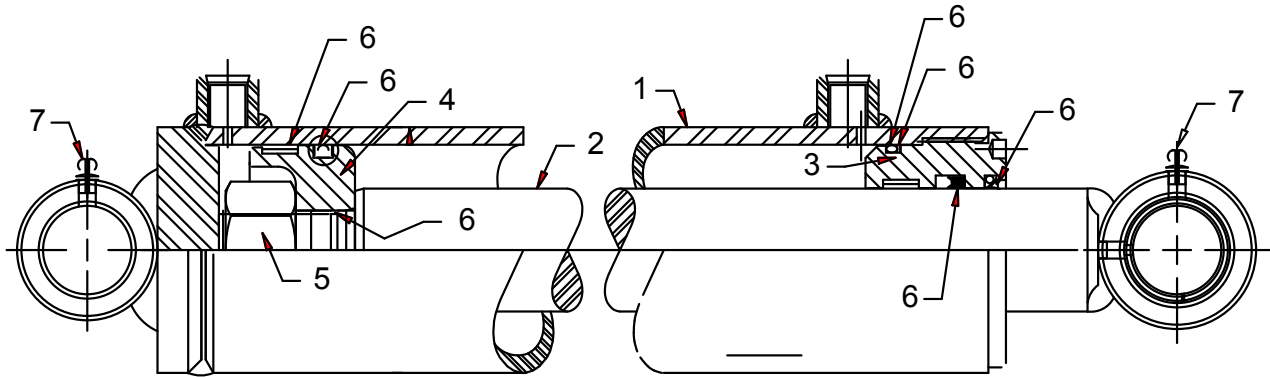
ITEM	QTY.	LAF4639	DESCRIPTION
1	1	LAF4644	Cylinder Tube
2	1	LAF4645	Cylinder Rod
3	1	LAF4610	Cylinder Gland
4	1	LAF4646	Piston
5	1	LAF4608	Nut 1.13" Torque to 350-480 ft. lbs.
6	1	LAF4607	Seal Kit (Includes all Seals, O-Rings, etc.)
7	1	LAF9401	Bushing 1.00" x 1.25" x 2.00"
8	3	6616	Grease Zerk

114594 CYLINDER ASSEMBLY



ITEM	QTY.	114594	DESCRIPTION
1	1	114595	Cylinder Tube
2	1	114596	Cylinder Rod
3	1	77443	Cylinder Gland
4	1	55904	Piston
5	1	1484	Nut 1.13" Torque to 350-480 ft. lbs.
6	1	45684	Seal Kit (Includes all Seals, O-Rings, etc.)
7	2	9371	Grease Zerk , 2MP

LAF4665 CYLINDER ASSEMBLY - SERVICE PARTS ONLY



ITEM	QTY.	LAF4665	DESCRIPTION
1	1	LAF4672	Cylinder Tube
2	1	LAF4673	Cylinder Rod
3	1	LAF4610	Cylinder Gland
4	1	LAF4646	Piston
5	1	LAF4608	Nut 1.13" Torque to 350-480 ft. lbs.
6	1	LAF4607	Seal Kit (Includes all Seals, O-Rings, etc.)
7	2	6616	Grease Zerk

